

Product Features

- Frequency from 8.8 ~ 9.4GHz
- GaN MMIC Technology for HPA
- 50ohm Input/Output Impedance
- 6BIT phase and attenuation control

Applications

- X-Band Radar



Description

The RRM8894010-M1D is designed for the Active Electronically Scanned Array (AESA) antenna systems. This T/R Module can provide 10W TX output power using GaN technology and provide the Low Noise function, which includes a limiter for the receiver protection. Moreover, it can also have a duplexer function of TX & RX utilizing a circulator. This module can be controlled and check module status information using serial data communication. Also, it is designed to store and utilize necessary information in the system by the built-in EEPROM.

Electrical Specifications @ Ta=25℃, 50Ω System

PARAMETER		UNIT	MIN	TYP	MAX	SYMBOL
Operating Frequency		GHz	8.8	-	9.4	F
Peak Output Power		dBm	40	-	-	P _{OUT}
Transmit Input Power		dBm	-	5	-	P _{IN}
Pulse Droop		dB	-	-	1	Droop
Pulse Width		us	-	-	100	P _w
Duty Cycle		%	-	-	20	D _c
Transmit Harmonics 1 to N		dBc	30	-	-	H _N
Pulse Rise & Fall time		ns	-	-	100	Tr / Tf
RX Gain		dB	31	-	-	Gr
RX Gain Flatness		dB	-	-	2	Gf
RX Noise Figure		dB	-	-	4	N
RX Input & Output VSWR		-	-	-	2.5	VSWR
RX Output 1dB Compression		dBm	1	-	-	R _{p1}
Tx / Rx Switching Time		ns	-	-	500	T _s
Digital Attenuator		-	6 BIT, LSB=0.5dB, 0~31.5dB			AT
Digital Phase Shifter		-	6 BIT, LSB=5.625°, 0~354.625°			PS
Operating Voltage		-	DC +28V, DC +6V			V
Control & Monitoring	Control Interface	-	LVDS			SPI
	Alarm	-	Over Temperature			
		-	Over Pulse Width			
		-	Over Duty			
- Test Conditions						

Pulse width = 100us, Duty cycle = 20%, Ta = 25°C, TX input power = +5dBm

Environmental Specifications

Operating Temperature⁽¹⁾	-10 °C to +50 °C
Storage Temperature	-40 °C to +70 °C
Humidity	Non-condensing Relative humidity level of 0 ~ 90%

(1) Temperature measured at Temp. sensor inside

Mechanical Specifications

Physiact Dimension (W × D × H)	112.0mm x 48mm x 17mm
DC & Control signal Connector	Micro D-sub 25 pin (Female)
RF Connector	SMP Connector (Male)

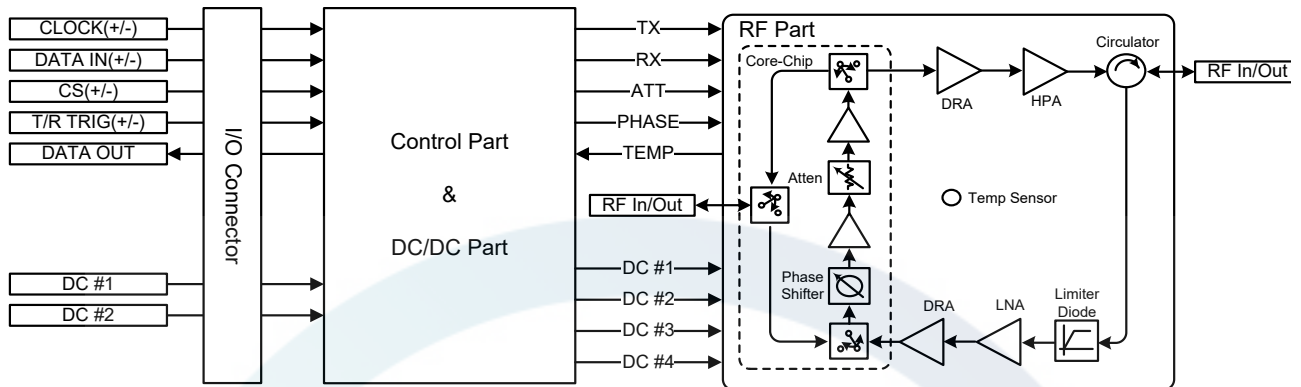
Interface

No	Function	I/O	Description	No	Function		Description
1	SPI_CLOCK+	IN	10MHz	14	SPI_CLOCK -	IN	10MHz
2	GND		Ground	15	GND		Ground
3	SPI_MOSI+	IN		16	SPI_MOSI -	IN	
4	SPI_CS +	IN		17	SPI_CS -	IN	
5	T/R TRIGGER +	IN		18	T/R TRIGGER -	IN	
6	SPI_MISO+	OUT		19	SPI_MISO -	OUT	
7	GND		Ground	20	GND		Ground
8	GND		Ground	21	GND		Ground
9	GND		Ground	22	GND		Ground
10	NC		-	23	NC		-
11	DC #2	IN	+6V	24	DC #2	IN	+6V
12	DC #1	IN	HPA Vds(+28V)	25	DC #1	IN	HPA Vds(+28V)
13	DC #1	IN	HPA Vds(+28V)				

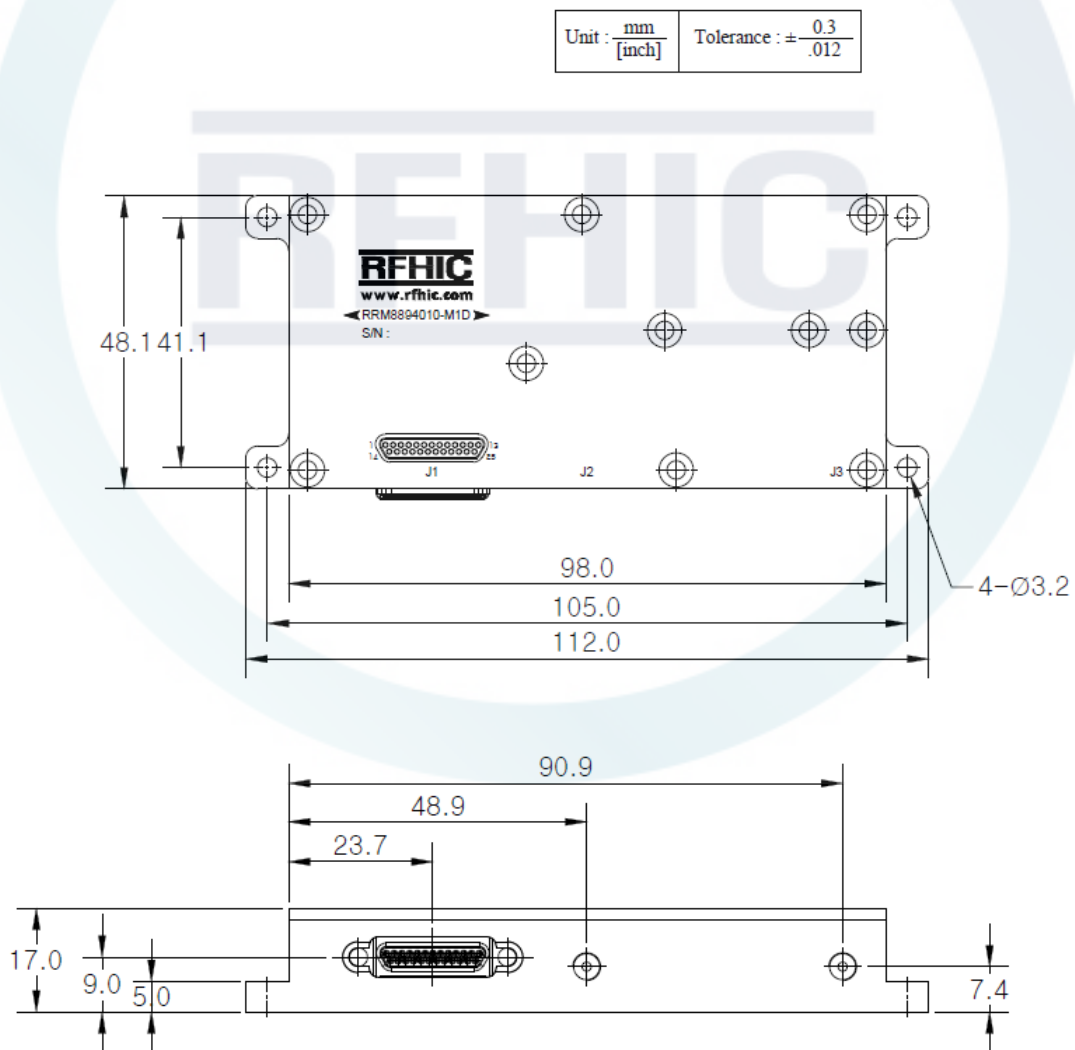
Signals

Signal Name	Direction	Description
SPI_CLOCK	Input	SPI bus clock generated by master. The frequency is 10 MHz nominal. Clock Is continuous.
SPI_CS	Input	SPI chip select generated by the master. It is active-low and indicates the active portion of the frame.
SPI_MOSI	Input	Data from the master to slave.
SPI_MISO	output	Data from slave to master.

Block Diagram



Drawing



Revision History

Part Number	Release Date	Version	Description	Data Sheet Status
RRM8894010-M1D	Oct, 2020	0.1	Initial release of datasheet	



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